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WU WIRTSCHAFTS UNIVERSITÄT WIEN VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS

WU International Taxation Research Paper Series

No. 2020 - 08

Monitoring and Tax Planning – Evidence from State-Owned Enterprises

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Research Papers

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June 20, 2020

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Abstract

In this paper, we provide new evidence on the association of state ownership and tax planning and show that shareholders' monitoring incentives affect a firm's tax planning. Using the unique setting of the German corporate tax system, we distinguish between state owners that directly benefit from state-owned enterprises' (SOEs') income tax payments and those that do not. Our results indicate that the negative association between state ownership and tax planning is concentrated in SOEs where the state owner directly benefits from the tax payments. These results are robust to various specifications and suggest that shareholders' monitoring incentives are a determinant of firms' tax planning activities.

1. Introduction

This study investigates if and to what extent shareholders' monitoring incentives affect tax-planning activities. Specifically, we analyze the tax planning activities of state-owned enterprises (SOEs), where the government acts not only as a tax collector but also as a shareholder. As such, the state owner benefits from the firm's profit in two distinct ways. First, as a tax collector, the state owner can benefit from the firm's income tax payments, provided that the state owner is actually collecting the tax in question.[1] Second, as a shareholder, the state owner receives its share of after-tax profit distributions. In its role as a shareholder, the state owner faces a trade-off because the state owner benefits from the tax payments but this burden translates to lower dividend distributions. This trade-off poses the question whether SOEs engage in more or less tax planning than Non-SOEs, a question about which prior studies have provided ambiguous empirical evidence (e.g., Lin et al. 2018; Bradshaw et al. 2019). In this paper, we investigate whether the different incentives of state owners who benefit to varying degrees from income tax revenues affect the tax planning activities of an SOE. We provide evidence that SOEs engage in less tax planning only when the state owner directly benefits from the tax revenues, suggesting that a shareholder's monitoring incentives are an important determinant of a firm's tax planning decision.

The theoretical predictions and empirical findings on the association of state ownership and tax planning are ambiguous. On the one hand, state owners can use their shareholder rights to incentivize a lower effective tax rate and increase their after-tax dividend. To pursue that goal, state owners may pressure tax authorities to act more favorably towards SOEs (e.g., Brown et al.

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[1] Not all state owners benefit from the tax payments because a state owner is not necessarily the governmental entity that receives the tax payments. In our setting, for example, the state owner can be the regional governmental entity, which, unlike local and federal governments, does not levy and receive a corporate income tax. We explain this difference between state owners in more detail in Section 2.1 and exploit it in our research design (see Section 3.2).

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2015; Kim and Zhang 2016; Lin et al. 2018). On the other hand, prior findings suggest that SOEs exhibit lower tax avoidance relative to Non-SOEs, implying that the incentive to maximize tax revenues dominates (Wu et al. 2012; e.g., Bradshaw et al. 2019). In that scenario, tax planning seems to constitute a "zero sum game" because higher after-tax dividends translate to lower tax revenues, assuming that the state owner would directly benefit from the tax revenues (i.e., the state owner is the governmental entity that receives the tax payments of the SOE) .

However, the assumption that a state owner directly benefits from a firm's income tax payments does not always hold. In a decentralized setting, where the federal, state, and/or local government levy income taxes and own enterprises, ownership and generation of tax revenues do not necessarily coincide. In this paper, we exploit this variation and investigate how different types of state owners with different incentives affect the tax planning activities of SOEs. Specifically, we predict that SOEs owned by state owners that directly benefit from income tax payments engage in less tax planning than Non-SOEs and SOEs owned by state owners that do not receive income tax payments. In other words, we ask whether the tax planning activities of SOEs depend on a state owner's incentives in order to address the broader question on how a shareholder's monitoring incentives affect a firm's tax planning activities.

In our empirical tests, we use a sample of German firms with SOEs and Non-SOEs because it allows us to examine different types of state owners within a market-based economy. The German corporate tax regime is particularly useful for our research question because we can differentiate between three governmental levels: federal, state, and local (more than 11,000 municipalities). Of these, the federal and local governments directly levy and benefit from income taxes while other governments (e.g., the 16 states in Germany) do not levy corporate income tax. Therefore, this setting allows us to distinguish between two types of state owners: those that benefit

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from increased tax payments (federal and local state owners) and those that do not (non-federal and non-local state owners). We use this cross-section of state owners in our empirical tests because only state owners directly benefiting from the tax payments have incentives to monitor their firms and demand less tax planning. Moreover, Germany is a market-based economy in which governmental interference is relatively low. In contrast, most prior studies on SOEs' tax planning activities use samples of Chinese firms but note that governmental interference is still relatively high in China. This interference translates to preferential tax treatment of SOEs (e.g., Wu et al. 2012)[2] and relatively weaker governance structures of Chinese firms in general (Bauer et al. 2019). Taken together, we believe that the German tax regime provides an interesting setting, which also allows us to generalize our findings.

Using unconsolidated financial data of private German firms from Bureau van Dijk's Orbis database, we find some evidence for an overall negative association of state ownership and tax planning. Further, we find that this negative association only holds for those SOEs with a state owner that directly benefits from the tax revenues. We run several sensitivity and robustness tests to confirm these initial results. First, we run all of our tests with an alternative measure of tax avoidance that controls for the difference in statutory tax rates between municipalities.[3] Second, we use entropy balancing and propensity score matching (PSM) to account for observable differences between SOEs and Non-SOEs. Lastly, we conduct tests in an SOE-only sample and find similar results to the full sample tests that include also Non-SOEs. We also find that the observed effect is concentrated in municipalities with a relatively low tax rate, suggesting that

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[2] A recent report by the Australian Tax and Transfer Pricing Institute (TTPI) institute provides further insight on the preferential tax incentives in China: https://www.austaxpolicy.com/china-state-oriented-attitude-towards-tax-incentives/

[3] As outlined in more detail in Section 3.1, the municipalities determine a significant fraction of the overall corporate income tax burden of German firms. We also use this special feature of the German tax system for additional tests (see Section 4.3).

local state owners monitor their SOEs towards higher tax payments only when the relative tax burden is not already high. Overall, our results suggest that shareholder monitoring incentives affect the tax planning activities of firms. Moreover, our findings present a more nuanced view of the relationship between state ownership and tax planning than the literature currently suggests. While prior research interprets lower tax planning in SOEs as an indicator for governmental power over the firm (Wu et al. 2012), our results imply that state owners, just like any other shareholder, can have different monitoring incentives.

Our findings contribute to prior research in three ways. First, we contribute to the literature on the role of agency conflicts in corporate tax planning (Desai and Dharmapala 2006). Following the agency framework of Desai and Dharmapala (2006), prior studies investigate the effect of a firm's corporate governance structure on the association of state ownership and tax planning. For example, Bradshaw et al. (2019) find that managers of Chinese SOEs cater to the interest of the government, the majority shareholder, in order to positively influence their promotion decisions. In this setting, the positive association between state ownership and tax planning is stronger when the government shareholder has more influence on the firm. These findings are in line with the agency theory of tax planning, which describes a manager's tax planning decision as a function of the manager's incentive structure and the corporate governance of the firm (Desai and Dharmapala 2006; 2009). However, while this stream of research investigates the incentive structure of the manager (i.e., the agent), we focus on the monitoring incentives of the shareholder (the principal). In contrast to common perception and prior research (e.g., Wu et al. 2012), we find that state owners only act as monitoring shareholders (in terms of the tax function) when they directly benefit from the tax revenues.

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Second, we add to the strand of literature that investigates the association of state ownership and tax avoidance. While some studies find that state owned firms engage in less tax planning (e.g., Zeng 2010; Wu et al. 2012; Bradshaw et al. 2019), other studies (Brown et al. 2015; Lin et al. 2018) find that politically connected firms experience lower tax enforcement. This finding implies that SOEs, which are likely politically connected by nature, have more tax planning opportunities and thus a lower tax burden. We add to these contrary findings by focusing on the *incentives* of state owners. As such, we provide evidence that these incentives are an important determinant for the tax planning activities of SOEs when the state owner directly benefits from tax revenues and thus has an incentive to monitor SOEs accordingly.

Finally, our results are of interest to policymakers. Despite waves of privatizations and a subsequent decrease of SOEs, a study by the OECD reveals that around 10 percent of the 2,000 largest firms in the world are SOEs (Kowalski et al. 2013). Moreover, the 2008 Financial Crisis and more recently the 2020 COVID-19 pandemic initiated increases in state ownership. For example, during the 2008 Financial Crisis, the U.S. government provided aid to struggling firms such as General Motors in return for shares. Similarly, Italy became a shareholder of the airline Air Italia as a reaction to the 2020 COVID-19 pandemic. This health crisis has inspired additional political discussions about linking governmental equity injections with a decrease in the respective firms' tax planning activities. On this point, our study informs policymakers that the direct participation in tax revenues can be an effective monitoring tool to curb the tax planning activities of SOEs. This result should also appeal to private shareholders (i.e., non-state-owners) of SOEs because they might face lower returns due to less tax planning activities.

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2. Background, Prior Research, and Hypothesis Development

2.1 The German Setting

The German government is divided into three levels, i.e., the federal level, the state level, and the local (or municipal)[4] level and state ownership is common in all three levels (Bundeskartellamt 2014). Some well-known examples are Deutsche Telekom with the federal government owning 17.41% and Volkswagen AG with the state government of Lower Saxony owning 20% (State of Lower Saxony 2017; Bundesministerium der Finanzen 2018). While the federal government's involvement often has historic reasons (e.g., the government's role as provider of telecommunication) and has been decreasing since a wave of privatizations over the last decades, municipal state ownership has increased during the last years (Bundeskartellamt 2014). Historically, municipalities invested in businesses activities of public interest (e.g., waste management or hospitals) but have broadened their scope of activities over the last years to sectors such as food processing (Bardt and Fuest 2007).

Public economists view this development critically because, among other reasons, they fear a competitive advantage of these SOEs over private business activities (Bundeskartellamt 2014). This concern is partly rooted in the potentially beneficial tax treatment. However, to receive a favorable tax treatment, an SOE has to be organized as a non-profit firm. Moreover, the local business tax[5] is one of the municipalities' main sources of tax revenues such that preferential tax treatment would hurt their revenue base. In fact, a current report by the German Anti-trust Commission mentions higher tax revenues (from the SOEs themselves as well as from positive

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[4] We use the terms "local government" and "municipality government" interchangeably.

[5] The local business tax is the corporate income tax that is levied by the local governments. We describe the German corporate tax setting in more detail in Section 3.1.

spillovers) as one reason for the increase of SOE activity over the last years (Monopolkommission 2014).

Income tax on business activities is levied on the federal level (individual and corporate income tax) at a flat rate of 15.825 percent[6] and on the municipal level (local business tax, LBT). Municipalities determine the LBT, which is also flat and ranges from 7 to over 30 percent across municipalities, depending on the municipality the firm is headquartered in.[7] The 16 states do not levy an own income tax but receive a federal re-distribution of individual and corporate income tax revenues, which follows a mechanism based on a state's economic strength (*"Finanzausgleich"*).

Taken together, the German setting provides a sufficient number of SOEs and, importantly, variation in the state owners' incentives. Specifically, we use the different incentives that state owners from the three levels of government have because some state owners directly benefit (federal and local governments) from tax payments of their SOEs while others (e.g., state governments) do not benefit.

2.2   *Ownership Structure and Tax Planning*

A firm's ownership structure and governance is one of the determinants of corporate tax planning acitvities (Hanlon and Heitzman 2010). In this line, Desai and Dharmapala (2006) argue that a firm's propensity to engage in tax planning depends on a manager's incentive structure and the firm's overall governance. Firms with strong governance structures facilitate tax planning as

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[6] 15% federal corporate income tax plus 5.5% federal additional surcharge ("Solidarity Surcharge") on the federal corporate income tax. We account for this when we calculate statutory tax rates.

[7] The taxable income of firms with several branches across different municipalities is apportioned to the respective municipalities based on wages paid. However, the number of firms with business activities on more than one municipality is rather low (see, for example, Bethmann 2017).

shareholder are less concerned with managerial rent extraction due to tax planning, especially when firms have relatively low levels of tax planning (Armstrong et al. 2015). This insight motivates research on the association of a firm's shareholder structure and its tax planning activities because shareholders have a significant influence on a firm's corporate governance structure (e.g., Wilde and Wilson 2018). Similarly, the presence of majority shareholders shapes a firm's governance structure in various dimensions, especially because minority shareholders may suffer from rent extraction by the majority shareholder (Desai and Dharmapala 2006; 2009). Therefore, even though tax planning can increase the overall value of the firm, it might decrease minority shareholders' wealth. This ambiguous setting motivates various studies that investigate the effect on tax planning activities under the presence of certain majority shareholders.

For example, focusing on the influence of family owners as majority shareholders, Chen et al. (2010) predict and find that family ownership is associated with less tax planning activities. This is a signal to non-family minority shareholders, who could fear rent extraction masked by tax planning. Similarly, Khurana and Moser (2013) provide evidence that firms with long-term institutional investors are less tax aggressive. However, using a regression discontinuity design that allows for a more direct identification, Khan et al. (2017) find that institutional ownership actually leads to more tax aggressiveness. Moreover, Cheng et al. (2012) find that firms become more tax aggressive after hedge funds with tax expertise invest in a firm. These results imply that certain (institutional) investors monitor management such that it becomes more tax-efficient (i.e., uses all legal means to decrease its tax liability). Therefore, next to rent extraction by majority shareholders (Desai and Dharmapala 2006), monitoring and preventing management entrenchment is another channel through which owners influence a firm's tax planning activities. In this line, McGuire et al. (2014) find that dual class ownership firms are less tax aggressive, which hints at

suboptimal tax planning by entrenched managers. As dual class ownership structures disentangle control and cash-flow rights, managers can have excessive voting right and engage in suboptimal (i.e., too little) tax planning. Therefore, greater agency conflicts between control and cash-flow rights (i.e., between managers and shareholders) affect the tax planning outcome.

2.3 State Ownership and Tax Planning

A special form of concentrated shareholding is state ownership. Traditionally, state-owned enterprises are rare in the U.S. and most academic studies use a Chinese setting, where the government acts as a shareholder of a significant portion of firms.[8] In the Chinese setting, Zeng (2010) investigates the association of concentrated ownership and tax planning and finds that firms with concentrated ownership engage more in tax planning, relative to firms with spread ownership. Moreover, the study tests two contradicting hypotheses on state ownership. While state-owned firms can pursue a strategy to increase firm value by decreasing tax payments (i.e., increasing after-tax profits), the government has an interest to increase tax revenues to fund government activities. The study provides empirical evidence for the latter as Chines SOEs engage in less tax planning relative to Non-SOEs.

Similarly, Wu et al. (2012) investigate the role of Chinese state ownership on the association of firm size and tax avoidance. Addressing inconsistent results in prior studies on the relationship of size and tax planning, the authors predict and find that size and tax planning are positively associated for SOEs. The reason for the moderating effect of state ownership is that big SOEs, relative to smaller SOEs, have more political power (e.g., through lobbying). Bigger firms

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[8] During the 2008 Financial Crisis, the U.S. government increased its involvement in the economy through bailouts (e.g., General Motors or Citigroup). This government involvement has started discussion about state ownership also in the U.S. (see, for example, Kahan and Rock 2011).

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without government ownership ("Non-SOEs"), on the other hand, are less tax aggressive as they are more prone to regulatory scrutiny and have less tax planning opportunities relative to smaller Non-SOEs (this goes back to the "political cost view", see Zimmerman 1983; Watts and Zimmerman 1986). Another factor that determines a firm's tax strategies in the Chinese setting is the preferential tax treatment of certain firms. In this line, Wu et al. (2012) provide evidence that size and tax planning are not associated for firms with preferential tax treatment.

While these studies imply a mitigating effect of state ownership on tax planning in China, there is also evidence for a positive association of state ownership and tax planning activities. State-owned firms have closer political connections, and they can use this power to change tax law (or its enforcement) in their favor. In a U.S. setting for private firms, Brown et al. (2015) show that firms that invest in close connections to policymakers through campaign donations have lower future effective tax rates. Similarly, Kim and Zhang (2016) find that politically connected firms are less aggressive than non-connected firms. These results imply a favorable tax treatment of private firms closely connected to the government. Such implication likely extends to SOEs. Using data on Chinese firms and tax audits, Lin et al. (2018) provide similar evidence for the enforcement channel, suggesting that politically connected firms (i.e., firms with politically connected board members) benefit from a preferential tax treatment.

Taken together, theory as well as prior research is ambiguous about the association of state ownership and tax planning and we pose the following non-directional hypothesis (in the alternative form):

H1: SOEs exhibit a different level of tax planning compared to Non-SOEs.

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While the studies outlined above test for differences between state-owned and not state-owned firm, they do not address differences within state ownership (i.e., between different types of state ownership). In a Chinese setting, Chan et al. (2013) find, similar to Zeng (2010) and Wu et al. (2012), that SOEs are less tax aggressive than Non-SOEs. However, Chan et al. (2013) add cross-sectional evidence as firms with local state owners from less developed regions engage in more tax planning. The study relates this finding to lower corporate governance implementation standards in these regions. Bradshaw et al. (2019) also find differences between central and local shareholders in a Chinese setting. Specifically, they find that SOEs report higher ETRs than Non-SOEs but this effect is only present in local SOEs. The authors provide evidence that management career concerns drive this result as the promotions of managers of Chinese SOEs are contingent on government evaluations. Local governments tend to influence these evaluations more than the central government and therefore managers of local SOEs are more prone to political interventions and aim to "please the government" by paying more taxes.

We add to this literature by focusing on the different incentive structures that different state owners have. In particular, we focus on the return a state owner generates by investing in an SOE. To illustrate, imagine an SOE that is fully owned by the government. Moreover, the government also receives all of the corporate tax payments of that SOE. In this scenario, the government is indifferent on whether it receives the SOE's profit as tax payment or as dividend ("zero sum game"). The German setting, however, is different. German income tax on business activities is in part a federal corporate income tax and in part a local (municipal) business tax.[9] Municipal (federal) state owners directly benefit from the corporate tax payments only with regard to their respective

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[9] Both, the federal corporate income tax and the local business tax have a very similar tax base and only differ in terms of the tax rate.

municipal (federal) income tax. Other state owners (e.g., the 16 states) do not directly benefit from either tax.[10] Therefore, we predict that SOEs owned by state owners with a direct claim on the tax revenues (i.e., local or federal owners) incentivize management to be more tax compliant. Formally, we state the following hypothesis (in the alternative form):

H2: Relative to SOEs with state owners that do not directly benefit from tax revenues, SOEs with state owners that directly benefit from tax revenues engage in less tax planning.

3. Data and Research Design

3.1 The German Corporate Tax System and Measures of Tax Avoidance

Statutory tax rates include the federal corporate income tax rate of 15.825 percent and the local business tax rate (LBT), which differs across municipalities. In our sample, the median and mean LBT rate are 14.2 percent. Apart from the LBT rate differentials, there are no tax regime differences between the municipalities. That is, the LBT base is the same independent of a firm's location, but rates vary depending on the municipality a firm is headquartered in. To gauge tax planning in this setting, we refer to prior research and adapt two measures. First, we define a firm's effective tax rate (ETR) as:

$$ETR_{i,t} = \frac{Taxes_{i,t}}{PTI_{i,t}} \tag{1}$$

where $Taxes_{i,t}$ is total tax expense and $PTI_{i,t}$ is pre-tax income (both at the firm-year level). Following prior studies, a lower ETR indicates more tax avoidance (e.g., Chen et al. 2010).

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[10] These other state owners may benefit indirectly via transfer payments. However, such benefit is more uncertain and considerably less in amount.

Due to the tax rate variation between municipalities, the ETR does not capture "statutory" differences in tax rate. Therefore, as a second measure, we adapt the tax avoidance measure developed by Atwood et al. (2012). This measure is mostly used to control for between-country differences in statutory tax rates as the measure relates a firm's ETR to the given jurisdiction's statutory tax rate (e.g., De Simone, Stomberg, et al. 2019). In our setting, there are different *within-country* jurisdictions, namely the different municipalities. Thus, we define *TaxAvoid* as:

$$TaxAvoid_{i,t} = \frac{PTI_{i,t} * \tau_{m,t} - Taxes_{i,t}}{PTI_{i,t}} = \tau_{m,t} - ETR_{i,t} \tag{2}$$

where $Taxes_{i,t}$ is total tax expense, $PTI_{i,t}$ is pre-tax income (both at the firm-year level), and $\tau_{m,t}$ is the total statutory tax rate (i.e., federal corporate tax rate plus the respective LBT rate) in municipality *m* in year *t*. The interpretation of this measure is mirroring that of the ETR: higher *TaxAvoid* indicates higher tax avoidance. By definition (and as evident in Table 2), *TaxAvoid* is highly correlated with *ETR*, but still provides additional information as it directly controls for different statutory tax rates between municipalities.[11]

3.2 Research Design

To test our predictions, we follow Chen et al. (2010) and estimate the model below using OLS:

$$\begin{cases} ETR_{i,t} \\ TaxAvoid_{i,t} \end{cases} = \alpha_j + \alpha_s + \alpha_t + \beta_1 SOE_{i,t} + \sum \beta_k Controls_{i,t}^k + \varepsilon_{i,t} \tag{3}$$

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[11] For both *ETR* and *TaxAvoid*, we use the total tax expense rather than the current tax expense due to data restrictions (for a discussion, see, for example, Dyreng et al. 2008). Similarly, we cannot extend this measure by a cash component to calculate the cash effective tax rate as the Orbis database (and the financial reporting environment) does not provide information on actual cash effective tax payments.

where *ETR* (see Equation 1) is the effective tax rate and *TaxAvoid* (see Equation 2) the tax avoidance measure developed by Atwood et al. (2012). As described above, German corporations pay taxes to both the federal government and the local municipalities. The *TaxAvoid* measure, which in its original application accounts for differences of statutory tax rates between countries, captures the deviation of the effective tax rate from the municipality-specific statutory tax rate.

SOE is a dummy variable that equals one if a state owner has a direct shareholding in the firm. Therefore, β_1 is our coefficient of interest. Following H1, we predict β_1 to be positive (negative), meaning that SOEs have higher *ETRs* (lower tax avoidance, *TaxAvoid*). More importantly, we also differentiate between two types of state owners: those that directly benefit from the firm´s income tax payments (i.e., federal and municipal), and those that do not (e.g., the 16 states). We separately estimate Equation (3) for a sample with these two types of state owners (both times we include non-SOEs as benchmark). Following H2, we predict β_1 to be positive only when the state owner benefits from the income tax payments.

To account for time-invariant industry fixed effects, we include industry indicators (α_j) at the NACE two-digit level. Moreover, we add indicators for the 16 states in Germany to account for time-invariant state characteristics. This is important as States have the authority to regulate state ownership within their jurisdiction (Bundeskartellamt 2014). These regulations are relatively time-invariant and we can therefore capture these fixed effects with our approach. Finally, we control for macroeconomic time-variant fixed effects by including year indicators (α_t).

The vector *Controls* includes control variables similar to those used in Chen et al. (2010). Specifically, we include *RoA* to control for differences in profitability as profitable firms might face different tax planning incentives (e.g., Graham et al. 2014). Similarly, prior research (e.g.,

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Zimmerman 1983) provides evidence that firm size is related to tax planning, which is why we include *Size* (defined as the natural logarithm of total assets in year *t-1*) as control variable. Moreover, firms can carry forward losses and deduct interest payments from their tax base, which affects tax payments. We control for these deductions by including the variables *LossFirm* and *Leverage*. *LossFirm* is a dummy that equals one if the firm has a loss in more than half of the years in our sample period.[12] Moreover, we control for a firm's assets composition as the proportion of tangible and intangible assets potentially affects a firm's tax planning (e.g., De Simone, Mills, et al. 2019). Therefore, we include *Tangibility* and *Intangible* as control variables, measured as tangible assets over lagged total assets and intangible assets over lagged total assets, respectively. Finally, we include lagged sales growth (*SalesGrowth*) to capture growth opportunities as growth (and investment) can affect a firm's access to special tax deductions (e.g., Armstrong et al. 2012). While most studies (e.g., Chen et al. 2010) use market-to-book ratios to approximate growth opportunities, we use sales growth as our sample includes non-listed firms only. Finally, we include a dummy that equals one for firms that have a majority shareholder (i.e., a shareholder with a shareholding greater than 50 percent). This dummy captures the tax planning effects of blockholders (Khurana and Moser 2013; Khan et al. 2017). Appendix A provides an overview of all variable definitions.

3.3 Data and Sample Selection

We collect data on unconsolidated financial statements and the ownership structure of German firms from Bureau van Dijk's Orbis database, for the period 2007-2015. We exclude financial (NACE 6400 to 6899) and utility (NACE 3500 to 3999) firms as both fall under specific regulations (e.g., Badertscher et al. 2013). Moreover, we drop observations from industries (NACE

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[12] Our data do not contain a variable similar to net operating loss (*NOL*) in Compustat samples.

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two digit) that do not include SOEs to allow for within-industry analyses and we drop observations of non-profit firms as these are likely tax-exempt. We also drop observations with missing values for our dependent or independent variables.[13] We then check the data for outliers and drop observations with values of our dependent and some independent variables that are outside of the 1 and 99 percentile. Our final sample includes 124,613 firm-year observations. Appendix B summarizes our sample selection.

3.4 Descriptive Statistics

Table 1 provides descriptive statistics of our full sample as well as various subsamples. In the full sample (Panel A), the average ETR equals 26.51 percent, which is close to the sample's average statutory tax rate of 29.75 percent. The mean value of SOE implies that 2.17 percent of firms-years are observation with state ownership. In absolute numbers, this translates to 2,698 out of 124,613 firm-years (797 out of 48,367 unique firms). Comparing the Non-SOE sample (Panel B) with the SOE-only sample (Panel C) indicates a significant difference between the mean ETRs of these two groups. The ETR of Non-SOEs is about 4 percentage points higher than the ETR of SOEs.[14] Moreover, Non-SOEs (Panel B) and SOEs (Panel C) differ significantly in terms of most control variables. This motivates our choice to control for these variables in all our tests and to use weighting and matching techniques as well as sub-sample tests that only include SOEs.

In Panel D and E of Table 1, we provide descriptive statistics on the sub-sample of SOEs. Specifically, out of 2,698 total SOE firm-years, SOEs with a state owner that directly benefits from the tax revenues account for 1,156 firm-years (337 out of 797 unique firms). The remaining SOEs

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[13] As we find enormous outliers for *SalesGrowth*, we follow Engel and Middendorf (2009) and exclude observations with values of *SalesGrowth* higher (lower) than 300% (-300%).

[14] Untabulated tests show that this difference is only significant (economically as well as statistically) when industry fixed effects are not controlled for. Therefore, we include industry fixed effects in all our tests.

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account for 1,542 firm-years (460 out of 797 unique firms). Moreover, Panel D and E reveal that SOEs whose owner directly benefits from the tax revenues have significantly higher ETRs (lower tax avoidance) than SOEs with state owners that do not directly benefit from tax revenues.

4.   Results

4.1   Full sample tests

Table 3 presents the regressions results from Equation (3). In the full sample test with *ETR* as dependent variable (Table 3, Column 1), the coefficient on *SOE* (β_1) is positive but not statistically significant (p-value = 0.47). Similarly, the coefficient on *SOE* in the specification with *TaxAvoid* as dependent variable (Column 4) is not significant (p-value = 0.57) but negative as expected. Most of the coefficients of the control variables are statistically significant (also in joint tests) and reassure our choice to include them in the estimation. Based on this first result, we fail to reject the null that there is no difference in tax planning activities between SOEs and Non-SOEs (H1). However, to account for observable differences between SOEs and Non-SOEs, we apply two weighting and matching techniques, namely entropy balancing and propensity score matching (PSM).

First, following Hainmueller (2012), we balance the observations of the treatment (SOEs) and control (Non-SOEs) group using all three moments of the distribution of the control variables from Equation (3). Table 4 provides the mean, variance, and skewness of the covariate distribution before (Panel A) and after (Panel B) entropy balancing for SOEs and Non-SOEs. The covariate means of SOEs and Non-SOEs before entropy balancing (Panel A, Table 4) resemble those in Table 1 (Panel B for Non-SOEs and Panel C for SOEs). While the differences in the means of the covariates are statistically significant for all covariates *before* balancing, no covariate mean is

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statistically significant *after* balancing (Panel B of Table 4). Therefore, by using entropy balancing, we can mitigate concerns that observable differences between SOEs and Non-SOEs affect our results. Table 5 presents the results of estimating Equation (3) using the entropy-balanced sample. For both dependent variables, the coefficient on *SOE* is again not statistically significant (Columns 1 and 4). Therefore, also based on the balanced sample test, we cannot reject the null that there is no difference in tax planning activities between SOEs and Non-SOEs.

Second, we follow Shipman et al. (2017) and apply PSM using a logit estimation to account for observable differences in the control and treatment group. Specifically, PSM addresses concerns of observable differences between SOEs and Non-SOEs and functional form misspecification affecting our results. We use a one-to-one matching with replacement that assigns each observation in the treatment group (SOEs) the closest match in the control group (non-SOEs) in terms of the observable control variables (i.e., the control variables from Equation 3). We present descriptive statistics of the matched sample in Table 6. As we allow for replacement in the matching, the sample size of the matched sample is 4,515 while the estimation sample is slightly bigger (5,393 observations; see Table 7), indicating that some control firms are used twice (or more) in the estimation. Importantly, while there are statistically significant differences in the covariate means of SOEs and Non-SOEs *before* matching (Panel C and Panel B of Table 1), most differences are not statistically significant *after* matching (Panel C and Panel B of Table 6).

We present the estimation results of the matched sample in Table 7 and find that the coefficient on *SOE* is statistically significant for both dependent variables (Columns 1 and 4). The positive (negative) sign for *ETR* (*TaxAvoid*) implies that SOEs engage in less tax planning relative to Non-SOEs. Taken together, we interpret the null results from the OLS and entropy balancing estimations and the significant results from the PSM estimation as evidence for the theoretical

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ambiguous prediction on the association of state ownership and tax avoidance. Therefore, our findings reflect the inconsistent findings from prior studies (e.g., Zeng 2010; Lin et al. 2018).

4.2 State Owner Incentives

Our second hypothesis (H2) poses that differences in state owners' incentives affect tax planning activities of SOEs. Specifically, we predict that state owners that directly benefit from the tax revenues have higher incentives to monitor an SOE's tax planning. In Germany, municipal (federal) state owners are the main recipient of the local business tax (corporate income tax) revenues and therefore have an incentive to monitor the tax planning activities of SOEs. In other words, as tax-collecting agent, municipal and federal state owners have a preferred claim on the firm's profit and therefore prefer the tax claims even if this results in a lower after-tax dividend income. Therefore, we split our sample of SOEs based on the type of state owner, i.e., those that directly benefit from the tax income (federal and municipal) vs. those that do not (e.g., the 16 states). We predict that SOEs with shareholders that directly benefit from the tax revenues engage less in tax planning (i.e., have a higher *ETR* and lower *TaxAvoid*).

To this end, we estimate Equation (3) for both of those groups separately (both times with the Non-SOEs as control group). We present the results of this test in Columns 2 and 3 (Columns 5 and 6) of Table 3 using *ETR* (*TaxAvoid*) as dependent variable. We find that the coefficient on *SOE* is positive (negative) and statistically significant only for the SOEs with directly benefitting state owners (Columns 2 and 5), implying less tax planning. In economic terms, SOEs with directly benefitting state owners have, on average, a 2.4 percentage points or 9.1 percent (relative to the sample mean) higher ETR than Non-SOEs.[15] The results are similar when we use *TaxAvoid* as

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[15] For this calculation, we divide the coefficient of 0.024 (Table 3, Column 2) by the mean ETR of the full sample (Table 1, Panel A): 0.024/0.2651 = 0.091.

dependent variables (the sign is negative, which implies lower tax avoidance). As *TaxAvoid* captures the deviation of the ETR from the statutory tax rate in a given municipality, we can rule out that *Benefit* SOEs are systematically located in municipalities with higher LBT rates and thus have higher ETRs. Similarly, we test for differences in the mean statutory tax rates of *Benefit* and *Non-Benefit* SOEs and find no statistically significant differences (untabulated).

We corroborate the findings from these baseline tests by using entropy balancing and PSM to account for observable sample differences between SOEs and Non-SOEs as indicated by the descriptive statistics in Table 1. Table 5 and Table 7 (Columns 2 and 5) present the results and strengthen our initial interpretation as the coefficients on *SOE* remain statistically significant and are also economically very similar to those from the OLS estimation in Table 3. This finding indicates that our results are robust to observable differences between SOEs and Non-SOEs and to a potential functional form misspecification in our OLS estimations. Collectively, the results provide evidence in line with H2 as they suggest that SOEs with directly benefitting state owners (*Benefit* SOEs) engage in less tax planning. To further investigate the role of state owners' incentives, we next focus on tests within the subsample of SOEs.

4.3 Further Tests Using the SOE-only Sample

To address concerns about inherent differences between SOEs and Non-SOEs, we investigate the subsample of 2,698 SOE firm-years (see Panel C of Table 1). Within this subsample, we can hold potential confounding factors, such as the selection choice of governments to invest in certain firms, constant. Relating to H2, we predict that SOEs with directly benefitting state owners have higher ETRs relative to non-local SOEs. We test this prediction by replacing the *SOE* dummy in Equation (3) with the dummy variable *Benefit* that is equal to one for SOEs with directly

benefitting state owners and zero otherwise.[16] Again, we separately include state (α_s), industry (α_j)[17], and year (α_t) fixed effects. The vector *Controls* includes the same control variables as in Equation (3). Formally, we estimate the following model using OLS:

$$\begin{cases} ETR_{i,t} \\ TaxAvoid_{i,t} \end{cases} = \alpha_j + \alpha_s + \alpha_t + \beta_1 Benefit_{i,t} + \sum \beta_k Controls_{i,t}^k + \varepsilon_{i,t} \qquad (4)$$

We present the results in Table 8 (Column 1) and find that the coefficient on *Benefit* is positive and statistically significant.[18] The result is also similar in magnitude to our baseline results as it implies a 3.3 percentage point higher ETR for SOEs whose state owner directly benefits from tax revenues, relative to SOEs whose state owner does not. The results are similar when we use *TaxAvoid* as dependent variable (Column 4). Overall, this result corroborates our previous findings on H2 as the type of state owner affects the tax planning activities of an SOE.

Moreover, we use the tax rate variation between German municipalities to extend our predictions and tests. While the results of the previous tests imply that municipal governments have an incentive to maximize tax revenues, they also need to maintain a competitive business environment with respect to other municipalities. Therefore, municipal governments face incentives to set attractive LBT rates while maintaining sufficient tax revenues (e.g., Buettner 2003; Foremny and Riedel 2014). As municipalities with higher LBT rates already collect higher absolute tax revenues (given the same tax base), SOEs in high tax municipalities (i.e., municipalities with above median LBT rates) might experience less pressure by the local state

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[16] Specifically, the dummy variable *Benefit* equals one if an SOE's shareholder is the federal government or a municipality and zero otherwise.

[17] In this specification, we use industry fixed effects based on the NACE *one* digit classification to ensure sufficient variation within the respective cells.

[18] As opposed to Hypothesis 1 (H1), Hypothesis 2 (H2) is directional, which requires a one-sided interpretation of the coefficients. However, to ensure consistency throughout the Tables, we continue to tabulate two-sided test statistics in Table 8.

owners. In other words, local owners may be more lenient in enforcing tax compliance when the LBT rate is already high.

To test this prediction, we estimate Equation (4) and split the sample along the median LBT rate of 14.2 percent. We present the results in Table 8 (Column 2 and 3) and find that the positive association between state ownership and a firm's ETR is concentrated among SOEs in low-tax municipalities. In terms of the magnitude, the positive coefficient on *Benefit* in Column 2 implies a 4.3 percentage point higher ETR for *Benefit* SOEs relative to *Non-Benefit* SOEs. The results are similar when we use *TaxAvoid* as dependent variable (Column 5 and 6). To address concerns about systematically selecting the subsamples in the sample split, we test whether the split disproportionally assigns *Benefit* and *Non-Benefit* SOEs to the subsamples. That is, we test whether splitting the sample along the median LBT rate leads to a distribution of *Benefit* and *Non-Benefit* SOEs that is different from that in the original sample (see Panel D and Panel E of Table 1). We find that the distribution of *Benefit* and *Non-Benefit* SOEs is not different after splitting the sample, mitigating concerns about a spurious sample split (untabulated).

We interpret this additional finding as evidence for the overall mechanism through which local state owners affect SOEs. That is, state owners affect SOEs' tax planning when the state owner directly participates in the tax revenues. However, state owners seem to do that in a way that does not burden the taxpayer (i.e., the SOE) too heavily. A related interpretation is that municipalities with lower LBT rates have, on average, a lower GDP per capita (Bethmann 2017). Therefore, municipalities with lower LBT rates (Columns 2 and 5 of Table 6) need to raise more tax revenues, which they can do by ensuring lower tax planning activity by their SOEs.

5. Conclusion

In this study, we present empirical evidence for the effect of shareholder-specific monitoring incentives on a firm's tax planning activities. Using the unique setting in Germany, which provides variation in the degree to which a state owner benefits from an SOE's tax payments, we show that the incentives of a state owner are an important determinant of SOEs' tax planning activities. Specifically, we find that only state owners that benefit from the tax revenues engage in less tax planning. Our results are robust to various specifications and subsample tests.

We contribute to prior research by showing that shareholder incentives are a determinant of tax planning activities. Moreover, we provide new evidence on the role of state ownership and corporate tax planning activities (e.g., Lin et al. 2018; Bradshaw et al. 2019). In the realm of SOEs, the shareholder incentives are unique as the shareholder (i.e., the state owner) has two claims on the firm's residual, namely the tax payment and the after-tax dividend. When the state owner receives 100 percent of each of these claims, the owner should be indifferent on whether that claim is paid as a tax or as a dividend. In our setting, however, not every state owner directly benefits from the tax revenues. Using this variation in incentives, we find that only state owners that have a direct claim on the tax revenues have an incentive to ensure lower tax planning activities of the SOEs.

Lastly, our findings inform policymakers on the tax consequences of state ownership, which addresses the current discussion on tax planning activities of firms that might become partly state owned as consequence of the COVID-19 pandemic. We find that in order to ensure lower tax planning in an SOE, the state owner has to have a claim on the tax revenues. As our study is set in a developed market economy with generally low governmental interferences, we believe that our findings are generalizable and of interest to policymakers around the world.

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APPENDIX A: VARIABLE DEFINITIONS

Variable	Definition
Benefit	Dummy that is equal to one if an SOEs shareholder directly benefits from the firm's tax revenues
ETR	Effective Tax Rate, defined as tax expense (incl. deferrals) over pre-tax income
Intangible	Intangible assets scaled by lagged total assets
Leverage	Long-term (i.e., non-current) liabilities scaled by lagged total assets
Lossfirm	Dummy that is equal to one if a firm reports a loss in more than half of the available firm-years
MajorSH	Dummy that is equal to one if a firm has a majority shareholder (>50%)
RoA	Return on Assets, defined as operating income over lagged total assets
SalesGrowth	Change in sales relative to prior year's sales
Size	Natural logarithm of total assets
SOE	State-owned Enterprises dummy that is equal to one if a firm is (partly) owned by a government entity
SOE_share	The percentage of shares the government entity holds of the SOE
Tangibility	Fixed assets scaled by lagged total assets
TaxAvoid	Statutory tax rate (includes federal corporate tax rate in year t and local business tax in municipality m in year t) minus ETR

APPENDIX B: SAMPLE SELECTION

Sample Selection	Observations (firm-years)
Firms headquartered in Germany (from Orbis) after dropping: obs. w/ no or limited financial information, financials (NACE 6400 to 6899), utilities (NACE 3500 to 3999), and consolidated accounts	504,048
After merging shareholder information (from Orbis)	481,071
After dropping obs. in industries (NACE 2-digit) that do not include SOEs	441,713
After dropping non-profit firms	433,022
After dropping obs. w/ missing values for *ETR*, *Leverage*, *Tangibility*, *Size*, *Intangibles*, *SalesGrowth*, or *RoA*; or obs. w/ values above (below) 300% (-300%) for *SalesGrowth*	133,052
After dropping obs. w/ values outside of the 1-99 percentiles of observations of *ETR*, *Tangibility*, *Leverage*, or *RoA*	124,613
Final sample	**124,613**

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Table 1: Descriptive Statistics

Variables	N	Mean	S.D.	Q1	Median	Q3
			Panel A: Full Sample			
ETR	124,613	0.2651	0.1727	0.1389	0.2926	0.3371
TaxAvoid	124,613	0.0324	0.1730	-0.0378	-0.0013	0.1583
SOE	124,613	0.0217	0.1455	0	0	0
RoA	124,613	0.1425	0.1409	0.0504	0.0981	0.1845
Tangibility	124,613	0.2832	0.2538	0.0748	0.2032	0.4344
Size	124,613	8.2958	1.9878	6.7845	8.2472	9.7286
SalesGrowth	124,613	0.1098	0.3541	-0.0414	0.0485	0.1789
Leverage	124,613	0.3174	0.2768	0.1119	0.2379	0.4403
Intangible	124,613	0.0169	0.0587	0.0000	0.0012	0.0080
Lossfirm	124,613	0.0896	0.2857	0.0000	0.0000	0.0000
MajorSH	124,613	0.9241	0.2648	1.0000	1.0000	1.0000
			Panel B: Non-SOEs only			
ETR	121,915	0.2660	0.1710	0.1429	0.2933	0.3371
TaxAvoid	121,915	0.0315	0.1714	-0.0378	-0.0016	0.1533
RoA	121,915	0.1445	0.1413	0.0519	0.1000	0.1870
Tangibility	121,915	0.2759	0.2482	0.0733	0.1983	0.4213
Size	121,915	8.2559	1.9705	6.7627	8.2028	9.6645
SalesGrowth	121,915	0.1109	0.3561	-0.0426	0.0492	0.1818
Leverage	121,915	0.3178	0.2778	0.1117	0.2376	0.4404
Intangible	121,915	0.0168	0.0588	0.0000	0.0011	0.0079
Lossfirm	121,915	0.0877	0.2829	0.0000	0.0000	0.0000
MajorSH	121,915	0.9389	0.2396	1.0000	1.0000	1.0000
			Panel C: SOEs only			
ETR	2,698	0.2261*	0.2312	0.0262	0.1627	0.3333
TaxAvoid	2,698	0.0728*	0.2307	-0.0365	0.1332	0.2666
SOE_share	2,698	72.5468*	37.1108	49.0000	99.9700	100.0000
RoA	2,698	0.0529*	0.0798	0.0134	0.0293	0.0597
Tangibility	2,698	0.6137*	0.2862	0.4335	0.7035	0.8290
Size	2,698	10.0968*	1.9346	8.9598	10.3674	11.4209
SalesGrowth	2,698	0.0588*	0.2406	0.0008	0.0366	0.0797
Leverage	2,698	0.3007*	0.2255	0.1195	0.2516	0.4338
Intangible	2,698	0.0226*	0.0545	0.0005	0.0036	0.0188
Lossfirm	2,698	0.1764*	0.3813	0.0000	0.0000	0.0000
MajorSH	2,698	0.2595*	0.4384	0.0000	0.0000	1.0000

Panel D: *Benefit* SOEs only						
ETR	1,156	0.2513	0.2271	0.0486	0.2167	0.3745
TaxAvoid	1,156	0.0508	0.2287	-0.0699	0.0829	0.2536
SOE_share	1,156	83.7596	30.1979	74.9000	100.0000	100.0000
RoA	1,156	0.0455	0.0633	0.0145	0.0287	0.0550
Tangibility	1,156	0.6443	0.2763	0.5120	0.7187	0.8439
Size	1,156	10.1968	1.9521	9.0541	10.4285	11.5595
SalesGrowth	1,156	0.0547	0.2683	-0.0097	0.0322	0.0778
Leverage	1,156	0.3588	0.2283	0.1699	0.3372	0.5151
Intangible	1,156	0.0187	0.0491	0.0002	0.0026	0.0145
Lossfirm	1,156	0.1583	0.3652	0.0000	0.0000	0.0000
MajorSH	1,156	0.1202	0.3254	0.0000	0.0000	0.0000
Panel E: *Non-Benefit* SOEs only						
ETR	1,542	0.2071*	0.2325	0.0196	0.1298	0.3187
TaxAvoid	1,542	0.0893*	0.2309	-0.0185	0.1629	0.2720
SOE_share	1,542	64.1409*	39.5201	25.2000	64.9650	100.0000
RoA	1,542	0.0584*	0.0898	0.0130	0.0299	0.0648
Tangibility	1,542	0.5907*	0.2913	0.3819	0.6856	0.8147
Size	1,542	10.0217	1.9186	8.8532	10.2483	11.3347
SalesGrowth	1,542	0.0620	0.2175	0.0078	0.0393	0.0812
Leverage	1,542	0.2570*	0.2133	0.0958	0.2032	0.3551
Intangible	1,542	0.0255*	0.0580	0.0010	0.0043	0.0232
Lossfirm	1,542	0.1900	0.3924	0.0000	0.0000	0.0000
MajorSH	1,542	0.3638*	0.4813	0.0000	0.0000	1.0000

Note: This table presents descriptive statistics. Panel A presents information for the full sample. Panel B (C) displays information for the subsample of firm-years with (without) state ownership. Panel D (E) presents information on the subsample of firm-years with state ownership where the state owner does (does not) directly benefit from the tax revenues. In Panel C (Panel E), * denotes significant differences relative to Panel B (Panel D) at the 1% level (two-tailed).

Table 2: Correlation Table

Variables	ETR	TaxAvoid	SOE	RoA	Tangibility	Size	Sales Growth	Leverage	Intangible	Lossfirm	MajorSH
ETR	1										
TaxAvoid	**-0.9936**	1									
SOE	**-0.0336**	**0.0347**	1								
RoA	**-0.1042**	**0.1065**	**-0.0946**	1							
Tangibility	**-0.0609**	**0.0549**	**0.1937**	**-0.0927**	1						
Size	**-0.0389**	**0.0422**	**0.1348**	**-0.2125**	**0.196**	1					
SalesGrowth	**-0.0379**	**0.0371**	**-0.0214**	**0.1953**	0.0079	**-0.0891**	1				
Leverage	**-0.0271**	**0.0243**	**-0.009**	**0.0784**	**0.1775**	**-0.1342**	**0.0973**	1			
Intangible	**-0.0406**	**0.0445**	0.0144	0.0246	**0.1816**	**0.0268**	**0.0387**	**0.0391**	1		
Lossfirm	**-0.0981**	**0.0989**	**0.0452**	**-0.0669**	**0.0396**	0.0185	**0.0234**	**0.0455**	**0.0414**	1	
MajorSH	**0.0282**	**-0.0269**	**-0.3735**	**0.0377**	**-0.0973**	**-0.1004**	0.0092	0.0045	**-0.0252**	**-0.039**	1

Note: This table presents the Pearson correlation matrix. Bold coefficients indicate significance at the 1% level (two-tailed).

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Table 3: OLS Regression

Variables	(1) Coef. (t-stat)	(2) Coef. (t-stat)	(3) Coef. (t-stat)	(4) Coef. (t-stat)	(5) Coef. (t-stat)	(6) Coef. (t-stat)
	Full Sample	Full Sample w/ *Benefit* SOEs	Full Sample w/ Non-*Benefit* SOEs	Full Sample	Full Sample w/ *Benefit* SOEs	Full Sample w/ Non-*Benefit* SOEs
SOE	**0.006**	**0.024****	**-0.006**	**-0.005**	**-0.022***	**0.006**
	(0.721)	(2.150)	(-0.591)	(-0.574)	(-1.924)	(0.597)
RoA	-0.162***	-0.162***	-0.162***	0.164***	0.164***	0.163***
	(-31.027)	(-31.152)	(-30.975)	(31.520)	(31.652)	(31.453)
Tangibility	-0.013***	-0.012***	-0.014***	0.009***	0.009**	0.010***
	(-3.720)	(-3.609)	(-3.916)	(2.622)	(2.484)	(2.818)
Size	-0.002***	-0.002***	-0.001***	0.002***	0.002***	0.002***
	(-3.225)	(-3.458)	(-3.034)	(4.334)	(4.530)	(4.096)
SalesGrowth	-0.006***	-0.005***	-0.006***	0.006***	0.005***	0.005***
	(-4.075)	(-3.934)	(-3.984)	(4.050)	(3.905)	(3.960)
Leverage	-0.011***	-0.012***	-0.011***	0.011***	0.012***	0.011***
	(-4.092)	(-4.687)	(-4.321)	(4.167)	(4.752)	(4.375)
Intangible	-0.053***	-0.053***	-0.053***	0.060***	0.061***	0.061***
	(-3.797)	(-3.858)	(-3.811)	(4.342)	(4.401)	(4.345)
LossFirm	-0.056***	-0.057***	-0.056***	0.057***	0.058***	0.057***
	(-24.312)	(-24.911)	(-24.221)	(24.537)	(25.148)	(24.437)
MajorSH	0.008***	0.009***	0.009***	-0.007***	-0.008***	-0.009***
	(3.054)	(3.495)	(3.559)	(-2.832)	(-3.310)	(-3.345)
Observations	124,600	123,059	123,444	124,600	123,059	123,444
Adjusted R²	0.081	0.079	0.082	0.083	0.081	0.084
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: This table presents regression results for tests of the association between state ownership and tax planning (Equation 3) estimated using OLS. The dependent variables are *ETR* (Columns 1-3) and *TaxAvoid* (Columns 4-6). All variables are defined in Appendix A. In Columns 1 and 4, the estimation uses the full sample. In Columns 2 and 5 (3 and 6), we only include SOEs with state owners that do (do not) directly benefit from the tax revenues. We include state, industry (NACE two digit), and year indicators. Standard errors are clustered on the firm level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 4: Entropy Balancing Statistics

Variables	Mean	Variance	Skewness	Mean	Variance	Skewness
Panel A: Full Sample before Entropy Balancing						
	SOEs			**Non-SOEs**		
RoA	0.0529	0.0064	4.0390	0.1445	0.0200	2.1520
Tangibility	0.6137	0.0819	-0.7487	0.2759	0.0616	1.0320
Size	10.1000	3.7430	-0.5794	8.2560	3.8830	0.2139
SalesGrowth	0.0588	0.0579	4.2710	0.1109	0.1268	2.7620
Leverage	0.3007	0.0509	1.0530	0.3178	0.0772	1.5630
Intangible	0.0226	0.0030	4.9830	0.0168	0.0035	7.3130
Lossfirm	0.1764	0.1454	1.6980	0.0877	0.0800	2.9150
MajorSH	0.2595	0.1922	1.0980	0.9389	0.0574	-3.6630
Panel B: Full Sample after Entropy Balancing						
	SOEs			**Non-SOEs**		
RoA	0.0529	0.0064	4.0390	0.0529	0.0064	4.0400
Tangibility	0.6137	0.0819	-0.7487	0.6136	0.0819	-0.7485
Size	10.1000	3.7430	-0.5794	10.1000	3.7440	-0.5796
SalesGrowth	0.0588	0.0579	4.2710	0.0589	0.0579	4.2710
Leverage	0.3007	0.0509	1.0530	0.3007	0.0509	1.0560
Intangible	0.0226	0.0030	4.9830	0.0226	0.0030	4.9840
Lossfirm	0.1764	0.1454	1.6980	0.1765	0.1454	1.6970
MajorSH	0.2595	0.1922	1.0980	0.2596	0.1922	1.0970

Note: This table presents descriptive statistics before (Panel A) and after (Panel B) entropy balancing. We present descriptives on the mean, variance, and skewness of each balancing covariate for SOEs (Non-SOEs) in the first (last) three columns. In Panel A, * denotes significant mean differences between SOEs and Non-SOEs at the 1% level (two-tailed).

Table 5: Entropy Balancing

Variables	(1) Coef. (t-stat) Full Sample	(2) Coef. (t-stat) Full Sample w/ *Benefit* SOEs	(3) Coef. (t-stat) Full Sample w/ *Non-Benefit* SOEs	(4) Coef. (t-stat) Full Sample	(5) Coef. (t-stat) Full Sample w/ *Benefit* SOEs	(6) Coef. (t-stat) Full Sample w/ *Non-Benefit* SOEs
SOE	**0.012**	**0.028****	**-0.007**	**-0.012**	**-0.026***	**0.006**
	(1.139)	(2.112)	(-0.526)	(-1.103)	(-1.933)	(0.468)
RoA	-0.178***	-0.192***	-0.162***	0.179***	0.196***	0.162***
	(-3.598)	(-5.535)	(-3.118)	(3.656)	(5.880)	(3.103)
Tangibility	-0.047***	-0.054***	-0.066***	0.041**	0.047***	0.061***
	(-2.729)	(-3.430)	(-3.546)	(2.357)	(3.024)	(3.269)
Size	-0.003	-0.007***	0.001	0.004	0.008***	0.001
	(-1.032)	(-2.657)	(0.178)	(1.583)	(3.170)	(0.276)
SalesGrowth	-0.018*	-0.014	-0.017	0.019*	0.015	0.018
	(-1.719)	(-1.361)	(-1.391)	(1.801)	(1.446)	(1.503)
Leverage	0.102***	0.096***	0.101***	-0.100***	-0.095***	-0.101***
	(4.765)	(4.829)	(4.230)	(-4.660)	(-4.737)	(-4.182)
Intangible	0.082	0.129*	0.072	-0.067	-0.115*	-0.061
	(1.046)	(1.896)	(0.868)	(-0.855)	(-1.688)	(-0.735)
LossFirm	-0.011	-0.022*	-0.003	0.012	0.023**	0.004
	(-1.006)	(-1.942)	(-0.211)	(1.139)	(2.064)	(0.328)
MajorSH	0.001	0.004	0.009	0.001	-0.002	-0.007
	(0.185)	(0.479)	(1.224)	(0.091)	(-0.258)	(-0.898)
Observations	124,600	123,059	123,444	124,600	123,059	123,444
Adjusted R²	0.158	0.143	0.180	0.156	0.147	0.176
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: This table presents regression results for tests of the association between state ownership and tax planning (Equation 3) estimated using an entropy-balanced sample. The dependent variables are *ETR* (Columns 1-3) and *TaxAvoid* (Columns 4-6). All variables are defined in Appendix A. In Columns 1 and 4, the estimation uses the full sample. In Columns 2 and 5 (3 and 6), we only include SOEs with state owners that do (do not) directly benefit from the tax revenues. We include state, industry (NACE two digit), and year indicators. Standard errors are clustered on the firm level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 6: Descriptive Statistics (Propensity Score Matching)

Variables	N	Mean	S.D.	Q1	Median	Q3
Panel A: Full Sample after Propensity Score Matching						
ETR	4,515	0.2282	0.2161	0.0338	0.1925	0.3316
TaxAvoid	4,515	0.0696	0.2161	-0.0319	0.1043	0.2597
RoA	4,515	0.0585	0.0761	0.0159	0.0353	0.0740
Tangibility	4,515	0.5940	0.2918	0.3779	0.6761	0.8197
Size	4,515	9.9930	2.0241	8.8134	10.1867	11.3631
SalesGrowth	4,515	0.0619	0.2603	-0.0103	0.0362	0.0931
Leverage	4,515	0.2963	0.2285	0.1145	0.2450	0.4250
Intangible	4,515	0.0232	0.0690	0.0002	0.0029	0.0146
Lossfirm	4,515	0.1708	0.3763	0	0	0
MajorSH	4,515	0.3125	0.4636	0	0	1
Panel B: Sample after PSM - Non-SOEs only						
ETR	1,819	0.2311	0.1915	0.0566	0.2339	0.3264
TaxAvoid	1,819	0.0650	0.1923	-0.0272	0.0582	0.2398
RoA	1,819	0.0668	0.0694	0.0218	0.0496	0.0911
Tangibility	1,819	0.5648	0.2975	0.3344	0.6218	0.7999
Size	1,819	9.8397	2.1404	8.5537	9.9675	11.2111
SalesGrowth	1,819	0.0666	0.2871	-0.0346	0.0351	0.1188
Leverage	1,819	0.2899	0.2327	0.1069	0.2301	0.4152
Intangible	1,819	0.0242	0.0862	0.0000	0.0020	0.0100
Lossfirm	1,819	0.1627	0.3692	0	0	0
MajorSH	1,819	0.3914	0.4882	0	0	1
Panel C: Sample after PSM - SOEs only						
ETR	2,696	0.2262	0.2312	0.0262	0.1628	0.3333
TaxAvoid	2,696	0.0727	0.2308	-0.0366	0.1330	0.2667
RoA	2,696	0.0529*	0.0798	0.0134	0.0292	0.0597
Tangibility	2,696	0.6137*	0.2862	0.4332	0.7038	0.8291
Size	2,696	10.0965*	1.9352	8.9595	10.3674	11.4214
SalesGrowth	2,696	0.0587	0.2405	0.0008	0.0365	0.0793
Leverage	2,696	0.3006	0.2255	0.1195	0.2516	0.4337
Intangible	2,696	0.0226	0.0545	0.0005	0.0036	0.0188
Lossfirm	2,696	0.1762	0.3810	0.0000	0.0000	0.0000
MajorSH	2,696	0.2593*	0.4383	0	0	1

Note: This table presents descriptive statistics for the sample after Propensity Score Matching (with replacement). Panel A presents information for the full sample. Panel B (C) displays information for the subsample of firm-years with (without) state ownership. In Panel C, * denotes significant differences relative to Panel B at the 1% level (two-tailed).

Table 7: Propensity Score Matching

Variables	Dependent Variable: ETR			Dependent Variable: TaxAvoid		
	(1) Coef. (t-stat)	(2) Coef. (t-stat)	(3) Coef. (t-stat)	(4) Coef. (t-stat)	(5) Coef. (t-stat)	(6) Coef. (t-stat)
	Full Sample	Full Sample w/ *Benefit* SOEs	Full Sample w/ Non-*Benefit* SOEs	Full Sample	Full Sample w/ *Benefit* SOEs	Full Sample w/ Non-*Benefit* SOEs
SOE	**0.027****	**0.041*****	**0.007**	**-0.026****	**-0.039****	**-0.007**
	(2.255)	(2.737)	(0.515)	(-2.175)	(-2.574)	(-0.510)
RoA	-0.181***	-0.189***	-0.179**	0.179***	0.191***	0.175**
	(-2.695)	(-2.855)	(-2.434)	(2.687)	(2.953)	(2.367)
Tangibility	-0.047**	-0.052***	-0.070***	0.040**	0.044**	0.064***
	(-2.451)	(-2.647)	(-3.250)	(2.077)	(2.270)	(2.976)
Size	-0.001	-0.003	0.002	0.002	0.004	-0.001
	(-0.320)	(-1.079)	(0.779)	(0.744)	(1.402)	(-0.471)
SalesGrowth	-0.023*	-0.022	-0.025	0.024*	0.023	0.026
	(-1.765)	(-1.513)	(-1.557)	(1.843)	(1.577)	(1.642)
Leverage	0.095***	0.087***	0.094***	-0.093***	-0.085***	-0.093***
	(3.938)	(3.473)	(3.441)	(-3.811)	(-3.365)	(-3.361)
Intangible	0.012	0.022	0.007	-0.004	-0.016	-0.003
	(0.175)	(0.326)	(0.101)	(-0.062)	(-0.225)	(-0.048)
LossFirm	-0.016	-0.027**	-0.008	0.018	0.029**	0.010
	(-1.480)	(-2.158)	(-0.657)	(1.635)	(2.320)	(0.794)
MajorSH	0.000	0.002	0.009	0.001	-0.001	-0.007
	(0.052)	(0.176)	(0.998)	(0.120)	(-0.119)	(-0.798)
Observations	5,393	3,852	4,238	5,393	3,852	4,238
Adjusted R²	0.151	0.121	0.174	0.148	0.125	0.170
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: This table presents regression results for tests of the association between state ownership and tax planning (Equation 3) estimated on a matched sample using Propensity Score Matching (with replacement). The dependent variables are *ETR* (Columns 1-3) and *TaxAvoid* (Columns 4-6). All variables are defined in Appendix A. In Columns 1 and 4, the estimation uses the full sample. In Columns 2 and 5 (3 and 6), we only include SOEs with state owners that do (do not) directly benefit from the tax revenues. We include state, industry (NACE two digit), and year indicators. Standard errors are clustered on the firm level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 8: SOE Sample

Variables	(1) Coef. (t-stat) All SOEs	(2) Coef. (t-stat) LBT rate below median	(3) Coef. (t-stat) LBT rate above median	(4) Coef. (t-stat) All SOEs	(5) Coef. (t-stat) LBT rate below median	(6) Coef. (t-stat) LBT rate above median
Benefit	**0.033****	**0.043***	**0.009**	**-0.030***	**-0.041***	**-0.009**
	(2.008)	(1.920)	(0.365)	(-1.826)	(-1.830)	(-0.388)
RoA	-0.140	-0.315**	-0.101	0.136	0.302*	0.102
	(-1.110)	(-1.988)	(-0.643)	(1.091)	(1.921)	(0.648)
Tangibility	-0.058	-0.050	-0.085*	0.046	0.043	0.080
	(-1.533)	(-0.811)	(-1.703)	(1.228)	(0.707)	(1.595)
Size	-0.003	-0.008	0.004	0.005	0.009	-0.003
	(-0.568)	(-1.469)	(0.494)	(0.943)	(1.627)	(-0.422)
SalesGrowth	-0.014	-0.004	-0.011	0.015	0.005	0.012
	(-0.878)	(-0.149)	(-0.594)	(0.889)	(0.192)	(0.633)
Leverage	0.128***	0.105**	0.151**	-0.124***	-0.105**	-0.148**
	(3.254)	(2.088)	(2.578)	(-3.155)	(-2.115)	(-2.533)
Intangible	0.129	-0.192	0.381*	-0.111	0.199	-0.379*
	(0.955)	(-1.143)	(1.842)	(-0.825)	(1.194)	(-1.837)
LossFirm	-0.041**	-0.014	-0.064***	0.042***	0.015	0.066***
	(-2.538)	(-0.635)	(-2.746)	(2.629)	(0.688)	(2.816)
MajorSH	-0.014	-0.025	-0.014	0.018	0.027	0.014
	(-0.915)	(-1.305)	(-0.607)	(1.145)	(1.438)	(0.619)
Observations	2,697	1,320	1,370	2,697	1,320	1,370
Adjusted R²	0.085	0.106	0.091	0.080	0.107	0.093
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: This table presents regression results for tests of the association between state ownership and tax planning (Equation 4) estimated using OLS. The dependent variables are *ETR* (Columns 1-3) and *TaxAvoid* (Columns 4-6). All variables are defined in Appendix A. In Columns 1 and 4, the estimation uses the full sample of SOEs. In Columns 2 and 5 (3 and 6), we partition the sample and only include observations with LBT multipliers below (above) the median. We include state, industry (NACE one digit), and year indicators. Standard errors are clustered on the firm level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).